

CLAIMS

Revised

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1. A rotary barrier face seal for sealing a toxic process fluid at a space between a housing and a rotatable shaft, comprising:

a stationary ring unit coaxially surrounding said rotatable shaft within said housing and arranged for movement axially of said rotatable shaft under a resilient pressure;

10 a rotary ring unit coaxially surrounding said rotatable shaft within said housing and prevented from axial movement relative to said rotatable shaft when in operation position;

each of said ring units having an end face for mutual engagement under said resilient pressure to form a sealing 15 interface;

one of said ring units being mounted for rotation with said rotatable shaft;

20 one of said end faces comprising a plurality of helical grooves, said plurality of helical grooves extending inward, the innermost extent of said plurality of helical grooves defining an inner groove diameter, said inner groove diameter being larger than the diameter of the innermost extent of either of said end faces;

25 one of said end faces comprises a plurality of crescent-shaped pockets each containing a buffer gas supply opening adjacent each terminus of each pocket and each said opening being positioned at a fluid supply diameter concentric with said rotatable shaft and communicating with said sealing interface each supply opening being positioned above a buffer gas supply bore, the diameter of the supply opening being larger than the diameter of the supply bore; and

30 buffer fluid supply means communicating with said at least one supply bore to supply a buffer fluid to the sealing

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A1 interface.

2. A rotary barrier face seal according to claim 1 wherein the outer most extend of said plurality of helical grooves coincides with the outermost extent of that said end 5 face which includes said plurality of helical grooves.

3. A rotary barrier face seal according to claim 1 wherein the outermost extent of said plurality of helical grooves defines an outer groove diameter, said outer groove diameter being smaller than the diameter of the outer most 10 extent of either of said faces.

4. Cancel

5. A rotary barrier face seal according to claim 2 wherein one of said end faces comprises at least one crescent-shaped pocket communication with said at least one 15 supply bore.

6. Cancel

7. Cancel

8. Cancel

9. Cancel

20 A2 10. A rotary barrier face seal according to claim 1 in which said crescent-shaped pockets extend around the end face along said fluid diameter.

CLAIMS

Version showing changes made

1. A rotary barrier face seal for sealing a toxic process fluid at a space between a housing and a rotatable shaft, comprising:
 - a stationary ring unit coaxially surrounding said rotatable shaft within said housing and arranged for movement axially of said rotatable shaft under a resilient pressure;
 - 10 a rotary ring unit coaxially surrounding said rotatable shaft within said housing and prevented from axial movement relative to said rotatable shaft when in operation position;
 - 15 each of said ring units having an end face for mutual engagement under said resilient pressure to form a sealing interface;
 - one of said ring units being mounted for rotation with said rotatable shaft;
 - one of said end faces comprising a plurality of helical grooves, said plurality of helical grooves extending inward, the innermost extent of said plurality of helical grooves defining an inner groove diameter, said inner groove diameter being larger than the diameter of the innermost extent of either of said end faces;
 - [at least one of said ring units having at least one supply bore having supply opening communicating with said sealing interface;
 - 30 one of said end faces comprises a plurality of crescent-shaped pockets each containing a buffer gas supply opening adjacent each terminus of each pocket and each said opening being positioned at a fluid supply diameter concentric with said rotatable shaft and communicating with said sealing interface each supply opening being positioned above a buffer gas supply bore, the diameter of the supply opening being

larger than the diameter of the supply bore; and

 said supply opening positioned at a fluid supply diameter concentric with said rotatable shaft, said fluid supply diameter being larger than said groove diameter; and]

5 buffer fluid supply means communicating with said at least one supply bore to supply a buffer fluid to the sealing interface.

10 2. A rotary barrier face seal according to claim 1 wherein the outer most extend of said plurality of helical grooves coincides with the outermost extent of that said end face which includes said plurality of helical grooves.

15 3. A rotary barrier face seal according to claim 1 wherein the outermost extent of said plurality of helical grooves defines an outer groove diameter, said outer groove diameter being smaller than the diameter of the outer most extent of either of said faces.

4. Cancel

20 5. A rotary barrier face seal according to claim 2 wherein one of said end faces comprises at least one crescent-shaped pocket communication with said at least one supply bore.

6. Cancel

7. Cancel

8. Cancel

25 9. Cancel

10. A rotary barrier face seal according to claim 1 in which said crescent-shaped pockets extend around the end face along said fluid diameter.